

What is claimed is:

1. A rate matching calculation method, comprising the steps of:

obtaining the number of increase or decrease bits  
 5 on each channel for each frame, using data per frame on CCTrCH, the number of bits before rate matching in each TrCH to be transmitted on one frame simultaneously, and weight for each channel, according to the following equation (1);

10 obtaining a rate matching parameter on the basis of the number of increase or decrease bits on each channel for each frame,

wherein the number of increase or decrease bits on each channel for each frame is calculated by a corrected  
 15 equation in which b/a is substituted for b/a + 1/c<sup>2</sup> in equation (1):

$$Z_i = \left[ \frac{\sum_{m=1}^i RM_m \cdot N_{mj}}{\sum_{m=1}^i RM_m \cdot N_{mj}} \cdot N_{dataj} \right] \quad \text{for all } i = 1..I \quad (1)$$

b  
||  
 $\sum_{m=1}^i RM_m \cdot N_{mj}$   
||  
a      c

where RM<sub>i</sub> : rate matching attribute of TrCH#i

N<sub>i,j</sub> : the number of bits per frame on TrCH#i

25 N<sub>data,j</sub> : the number of bits on CCTrCH

$\Delta N_{i,j}$  : the number of increase or decrease bits  
on TrCH#i.

2. A rate matching calculation method, comprising the steps of:

obtaining the number of increase or decrease bits on each channel for each frame, using data per frame on 5 CCTrCH, the number of bits before rate matching in each TrCH to be transmitted on one frame simultaneously, and weight for each channel, according to the following equation (1);

obtaining a rate matching parameter on the basis 10 of the number of increase or decrease bits on each channel for each frame,

wherein in a case that a correct number of increase or decrease bits is not obtained by a combination of a, b and c, a predetermined the number of increase or 15 decrease bits is output:

$$Z_{ij} = \left[ \begin{array}{c|c} \sum_{m=1}^i RM_m \cdot N_{mj} & \\ \hline \sum_{m=1}^i RM_m \cdot N_{mj} & N_{data,j} \\ \hline a & c \end{array} \right] \quad \text{for all } i = 1..I \quad (1)$$

where RM<sub>i</sub> : rate matching attribute of TrCH#i

N<sub>i,j</sub> : the number of bits per frame on TrCH#i

N<sub>data,j</sub> : the number of bits on CCTrCH

25 ΔN<sub>i,j</sub> : the number of increase or decrease bits on TrCH#i.

3. A rate matching calculation method,

comprising the steps of:

obtaining the number of increase or decrease bits on each channel for each frame, using data per frame on CCTrCH, the number of bits before rate matching in each TrCH to be transmitted on one frame simultaneously, and weight for each channel, according to the following equation (1);

obtaining a rate matching parameter on the basis of the number of increase or decrease bits on each channel for each frame,

wherein the number of increase or decrease bits on each channel for each frame is obtained by calculating  $b \times c$  and then dividing a result of the calculation by a:

$$15 \quad Z_i = \left[ \frac{\sum_{m=1}^i RM_m \cdot N_{mj}}{\sum_{m=1}^r RM_m \cdot N_{mj}} \cdot N_{dataj} \right] \quad \text{for all } i = 1..I \quad (1)$$

$\begin{matrix} b \\ || \\ \sum_{m=1}^i RM_m \cdot N_{mj} \\ || \\ \sum_{m=1}^r RM_m \cdot N_{mj} \\ || \\ a \end{matrix} \quad \begin{matrix} c \\ || \\ N_{dataj} \\ || \\ N_{mj} \end{matrix}$

20 where  $RM_i$  : rate matching attribute of TrCH#i

$N_{i,j}$  : the number of bits per frame on TrCH#i

$N_{data,j}$  : the number of bits on CCTrCH

$\Delta N_{i,j}$  : the number of increase or decrease bits on TrCH#i.

25 4. The rate matching calculation method according to claim 3, wherein when the result of  $b \times c$  exceeds 32 bits, the value of  $b \times c$  is divided into upper

28 bits and lower 15 bits,  $a$  is subtracted from the upper 28 bits, "1" is set when the subtraction is enabled, while "0" is set when the subtraction is disabled, and after finishing the subtraction once, the upper 28 bits are shifted to the left by 1 bit,  $\alpha$  is added to the lowest bit of the lower bits, and the subtraction of  $a$  and bit shift processing is performed repeatedly 17 times.

5. A rate matching apparatus comprising:

storage means for storing program data of an  
equation where  $1/c^2$  is added to the result of  $b/a$  of the  
following equation (1) for use in obtaining the number  
of increase or decrease bits on each channel for each  
frame, using data per frame on CCTrCH, the number of bits  
before rate matching in each TrCH to be transmitted on  
one frame simultaneously, and weight for each channel:

$$Z_{ij} = \frac{\sum_{m=1}^i RM_m \cdot N_{mj}}{\sum_{m=1}^i RM_m \cdot N_{mj}} \cdot N_{dataj} \quad \text{for } all i = 1..I \quad (1)$$

where  $RMi$  : late matching attribute of  $TrCH\#i$

$N_{i,j}$  : the number of bits per frame on TrCH*i*

Ndata,j : the number of bits on CCTrCH

25         $\Delta Ni,j$  : the number of increase or decrease bits  
on TrCH#i;

calculating means for calculating the number of

increase or decrease bits on each channel for each frame according to the program data stored in said storage means; and

5 rate matching calculating means for calculating a  
 rate matching parameter on the basis of the number of  
 increase or decrease bits on each channel for each frame  
 obtained by said calculating means.

6. A rate matching apparatus comprising:

first storage means for storing program data of an  
 10 equation where  $1/c^2$  is added to the result of  $b/a$  of the  
 following equation (1) for use in obtaining the number  
 of increase or decrease bits on each channel for each  
 frame, using data per frame on CCTrCH, the number of bits  
 before rate matching in each TrCH to be transmitted on  
 15 one frame simultaneously, and weight for each channel:

$$Z_i = \left\lfloor \frac{\sum_{m=1}^i RM_m \cdot N_{mj}}{\sum_{m=1}^i RM_m \cdot N_{mj}} \cdot N_{data,j} \right\rfloor \quad \text{for all } i = 1..I \quad (1)$$

where  $RM_i$  : rate matching attribute of  $TrCH\#i$

$N_{i,j}$  : the number of bits per frame on  $TrCH\#i$

$N_{data,j}$  : the number of bits on CCTrCH

25  $\Delta N_{i,j}$  : the number of increase or decrease bits  
 on  $TrCH\#i$ ;

calculating means for calculating the number of

increase or decrease bits on each channel for each frame according to the program data stored in said first storage means;

second storage means for storing a combination of  
5 a, b and c where a result calculated by said calculating means is not a correct calculation result, and the correct calculation result in the combination;

outputting means for outputting combination stored in said second storage means substituting for the number  
10 of increase or decrease bits from said calculating means, in a case that a combination of a, b and c in inputting a, b and c is stored in said second storage means; and  
rate matching calculating means for calculating a rate matching parameter on the basis of either of the  
15 number of increase or decrease bits on each channel from said calculating means or said outputting means.

7. A rate matching apparatus comprising:

storage means for storing program data of the following equation (1) for use in obtaining the number  
20 of increase or decrease bits on each channel for each frame, using data per frame on CCTrCH, the number of bits before rate matching in each TrCH to be transmitted on one frame simultaneously, and weight for each channel:

$$\begin{array}{c}
 b \\
 \| \\
 Z_{ij} = \left[ \begin{array}{c|c}
 \sum_{m=1}^i RM_m \cdot N_{mj} & N_{dataj} \\
 \hline
 \sum_{m=1}^i RM_m \cdot N_{mj} & \| \\
 \| & c
 \end{array} \right] \quad \text{for all } i = 1..I \quad (1)
 \end{array}$$

5

where  $RM_i$  : rate matching attribute of TrCH#i

$N_{i,j}$  : the number of bits per frame on TrCH#i

$N_{data,j}$  : the number of bits on CCTrCH

10         $\Delta N_{i,j}$  : the number of increase or decrease bits  
on TrCH#i; and

calculating means for in the equation indicated by  
the program data stored in said storage means, first  
calculating  $b \times c$ , then dividing the result of  $b \times c$  by a,  
15 and thereby obtaining the number of increase or decrease  
bits on each channel for each frame.

8.       A rate matching apparatus according to claim  
7, wherein in the case where the result of  $b \times c$  exceeds  
32 bits, said calculating means divides a value of b  
20  $\times c$  into upper 28 bits and lower 15 bits, subtracts a from  
the upper 28 bits, sets "1" when the subtraction is  
enabled, while setting "0" when the subtraction is  
disabled, shifts the upper 28 bits to the left by 1 bit  
after finishing the subtraction once, adds a lowest bit  
25 of the lower bits to  $\alpha$ , and repeatedly performs the  
subtraction of a and bit shift processing 17 times.

9.       A base station apparatus comprising:

the rate matching apparatus according to any one of claims 5 to 8; and

a transmission/reception apparatus which inputs a frame extracted from a received signal to said rate matching apparatus at the time of receiving signals,  
5 while further inputting a frame to be transmitted to said rate matching apparatus at the time of transmitting signals.

10. A mobile station apparatus comprising:  
10 the rate matching apparatus according to any one of claims 5 to 8; and

a transmission/reception apparatus which inputs a frame extracted from a received signal to said rate matching apparatus at the time of receiving signals,  
15 while further inputting a frame to be transmitted to said rate matching apparatus at the time of transmitting signals.